

Soil fertility.—From a study of the distribution of phosphorus, nitrogen, calcium, potassium, and other elements in soils whose previous history and crop yields are known, certain Rothamsted plots, Pennsylvania State College fertility plots, and Strongsville, Ohio, plots, VAN ALSTINE⁸ draws conclusions as to the movement of nutrient elements in the soil.

Phosphorus used as a fertilizer moves but slightly in the soil, remaining fixed until removed by plants, or by the erosive action of water or wind. Certain alkali salts stimulate a larger use of phosphorus, especially by legumes. Potassium also is readily held by the soil, but moves somewhat more freely than phosphorus when other fertilizer salts are used. It may then be carried down beyond the reach of the root system. Nitrogen leaches out into the drainage water to a certain extent, but the loss is small if the crop remains on the soil throughout the growing season. Nitrogen will even accumulate in the soil, mostly in roots and other residues. Carbonates wash out of the soil readily, particularly in the presence of ammonium salts. Magnesium also will leach under this circumstance. The calcium content of the soil decreases as the carbonates go out, and with alkali fertilizers it decreases more rapidly than acidity develops. In the presence of ammonium salts, calcium loss occurs just about as rapidly as acidity develops. Such facts as these should be taken into consideration in developing a rational fertilizer practice.—C. A. SHULL.

Suspensor of *Trapa*.—TISON⁹ has described a remarkable suspensor developed by *Trapa natans*. For some time during embryogeny the suspensor region grows with remarkable vigor, the cells becoming numerous, as well as very large and turgid. The embryo is finally differentiated at the tip of the massive suspensor, which is also the source of nutritive supply to the embryo during its earlier stages. Similar suspensor behavior has been described by GUIGNARD among the Leguminosae, and by TREUB in certain Orchidaceae, but in none of them does the situation seem to be so extreme as in *Trapa*.—J. M. C.

***Opuntia*.**—GRIFFITHS¹⁰ has published 8 new species of *Opuntia*, which he has recognized in connection with cultures of *Opuntia* upon the Department of Agriculture grounds at Chico, California.—J. M. C.

⁸ VAN ALSTINE, E., The movement of plant food within the soil. *Soil Science* 6:281-308. 1918.

⁹ TISON, M. A., Sur le suspenseur du *Trapa natans* L. *Rev. Gén. Botanique* 31:219-228. *pl. 4. figs. 5.* 1919.

¹⁰ GRIFFITHS, DAVID, New and old species of *Opuntia*. *Bull. Torr. Bot. Club* 46:195-206. *pls. 9, 10.* 1919.